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THE ORDER SCHIZOMIDA (ARACHNIDA) IN THE NEW WORLD. IV. *GOODNIGHTORUM* AND *BRIGGSI* GROUPS AND UNPLACED SPECIES (SCHIZOMIDAE: *SCHIZOMUS*)[1]

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ABSTRACT

This is the fourth and final part of a systematic revision of the order Schizomida (Arachnida) in the New World. The *goodnightorum* and *briggsi* species groups are revised and four species which cannot be placed in recognized groups are described. The following species are described and assigned to the *goodnightorum* group: *S. goodnightorum* (Rowland), *S. orthoplax* Rowland, *S. lanceolatus* Rowland, and *S. silvino* Rowland and Reddell. The following species are described and assigned to the *briggsi* group: *S. pentapeltis* (Cook), *S. wessoni* (Chamberlin), *S. borregoensis* (Briggs and Hom), *S. shoshonensis* (Briggs and Hom), *S. joshuensis* (Rowland), *S. briggsi* (Rowland), and *S. belkini* (McDonald and Hogue). The following unplaced species are described: *S. troglobius* new species, *S. infernalis* Rowland, *Schizomus* sp. from Sierra Nevada, Colombia, and *S. armasi* new species.

INTRODUCTION

This is the fourth and final part of a revision of the arachnids of the order Schizomida in the New World. Previous reports have included the family Protoschizomidae and the *Schizomus dumitrescoae* group of the family Schizomidae (Rowland and Reddell 1979a), the *S. simonis* and *S. brasiliensis* groups (Rowland and Reddell 1979b), and the *S. mexicanus* and *S. pecki* groups (Rowland and Reddell 1980). The present report includes the *S. goodnightorum* group from southern Mexico and Guatemala and the *S. briggsi* group from the southwestern United States; also included are descriptions of four species which cannot be placed in any of the recognized species groups. Table 1 may be used to compare the species groups included here with the remaining groups of New World schizomids. A discussion of the zoogeography and phylogeny of the order in the New World is reserved for a future publication.

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The present study is based to a large extent on a dissertation prepared by the senior author at Texas Tech University, Lubbock, Texas (Rowland 1975a).

Family Schizomidae

GOODNIGHTORUM GROUP

Description.—Members of this group are characterized by small to large size (0.89-1.42 mm carapacial length). The color is brownish. The eyespots are distinct to indistinct, and are with irregular to round margins. The carapace has three or four pairs of dorsal and

Table 1.--Comparisons of the New World species groups of the genus Schizomus. See Rowland and Reddell (1979) for explanation of characters.

CHARACTER	dumitrescoae	simonis	brasiliensis	mexicanus	pecki	goodnightorum	briggsi
DORSAL SETAE	2-3	2-3	3-4	2-3	2-3	3-4	3-4
METAPELTIDIUM	entire	entire	split or entire	entire	entire	entire	split or entire
COLOR	brown or green	brown or green	brown or green	brown or green	brown	brown	brown or green
SPERMATHECAE	M < L	M < L	M = L	M > L	M > L	M > L	multiple
ART. FEM. FLAGELLUM	4	4	3	3	3	3	4
CARAPACE LENGTH	.96-1.37	1.07-1.34	.91-1.48	.98-1.37	1.31-1.74	.89-1.42	1.18-1.52
ABDOMINAL ELONGATION	none	present	none	none	none	present	none or present
ABDOMINAL PROCESS	present	present	present	absent	absent	absent	present
PEDIPALPAL DIMORPHISM	slight to strong	none	slight to strong	none to strong	none	none	none to strong
SHAPE MALE FLAGELLUM	bulbous	long	bulbous	bulbous	bulbous	long	long or bulbous

two apical setae. Abdominal segments VII or VIII to XII may be slightly to extremely attenuated in the males. No posterodorsal abdominal process is evident. The male flagellum is always elongate, narrow, and apically slender, and has either double or a single median pit. The female flagellum is moderate in length (0.22-0.31 mm) and is composed of three articles. The female spermathecae are characterized by the median pair being much longer than the laterals, with small or no terminal bulbs, and with slight sclerotization. The pedipalps are not sexually dimorphic.

Distribution.–México: Veracruz, Chiapas, Yucatán. Guatemala.

Remarks.–See Table 2 for comparisons of the species in the *goodnightorum* group.

Subordinate taxa.–*S. goodnightorum, S. orthoplax, S. lanceolatus, S. silvino.*

Schizomus goodnightorum (Rowland)
Figs. 1, 5-6, 8-9, 14

Heteroschizomus goodnightorum Rowland 1973a: 2-6; Rowland 1973b: 202.
Schizomus goodnightorum: Rowland and Reddell 1977: 83, 99, 100.

Description.–Male. Color brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with 10 bifid setae. Abdominal terga I-VII

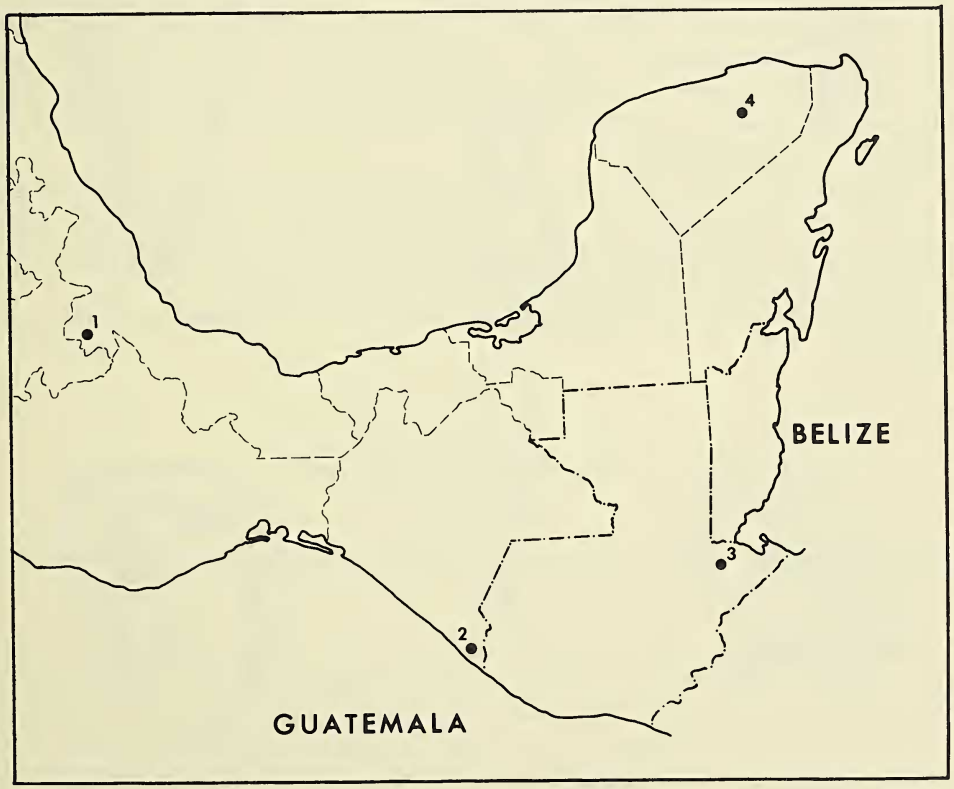


Fig. 1.–Map showing distribution of schizomids of the *goodnightorum* group: 1, *S. lanceolatus*; 2, *S. orthoplax*; 3, *S. silvino*; 4, *S. goodnightorum*.

with two setae, terga VIII-IX with four setae, segments VII-XII extremely elongated, segment XII with no evidence of posterodorsal process. Vestigial stigmata lighter than sterna. Flagellum long and extremely narrow, with a median pit. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/3 length of tarsus-basitarsus. Leg segment measurements given in Table 3.

Female. Flagellum composed of three articles. Spermathecae with medians several times longer than laterals, both divergent, the laterals thicker than medians, the latter terminating in slightly sclerotized, vaguely defined bulbs.

Type data.—Holotype male and paratype male taken at Chichén Itzá, Yucatán, México, June 1948 (C. Goodnight) (AMNH, examined).

Comparisons.—*S. goodnightorum* has a much greater elongation of distal abdominal segments in the male, and one fewer pair of dorsal carapacial setae than other members of this group. Males of the other species have a pair of dorsal flagellar depressions, while *S. goodnightorum* has a single depression. The male of this species is further distinguishable from other males with any degree of attenuation of distal abdominal segments outside the *goodnightorum* group by its lack of a posterodorsal abdominal process. The median spermathecae of *S. goodnightorum* are much longer than those of *S. silvino*, the only other species in this group known by females.

Distribution.—Known only from the type locality.

Remarks.—The placement of this species in the genus *Schizomus* was, in part, necessitated by the discovery of several other species with a distinct, although less, attenuation of the distal abdominal segments. Since the original description a female, undoubtedly referable to this species, has also become available for study. It has thus become apparent that the extreme attenuation of the abdomen is a sexually dimorphic feature and that the females are without pecularities which would separate them from other species in the genus *Schizomus*.

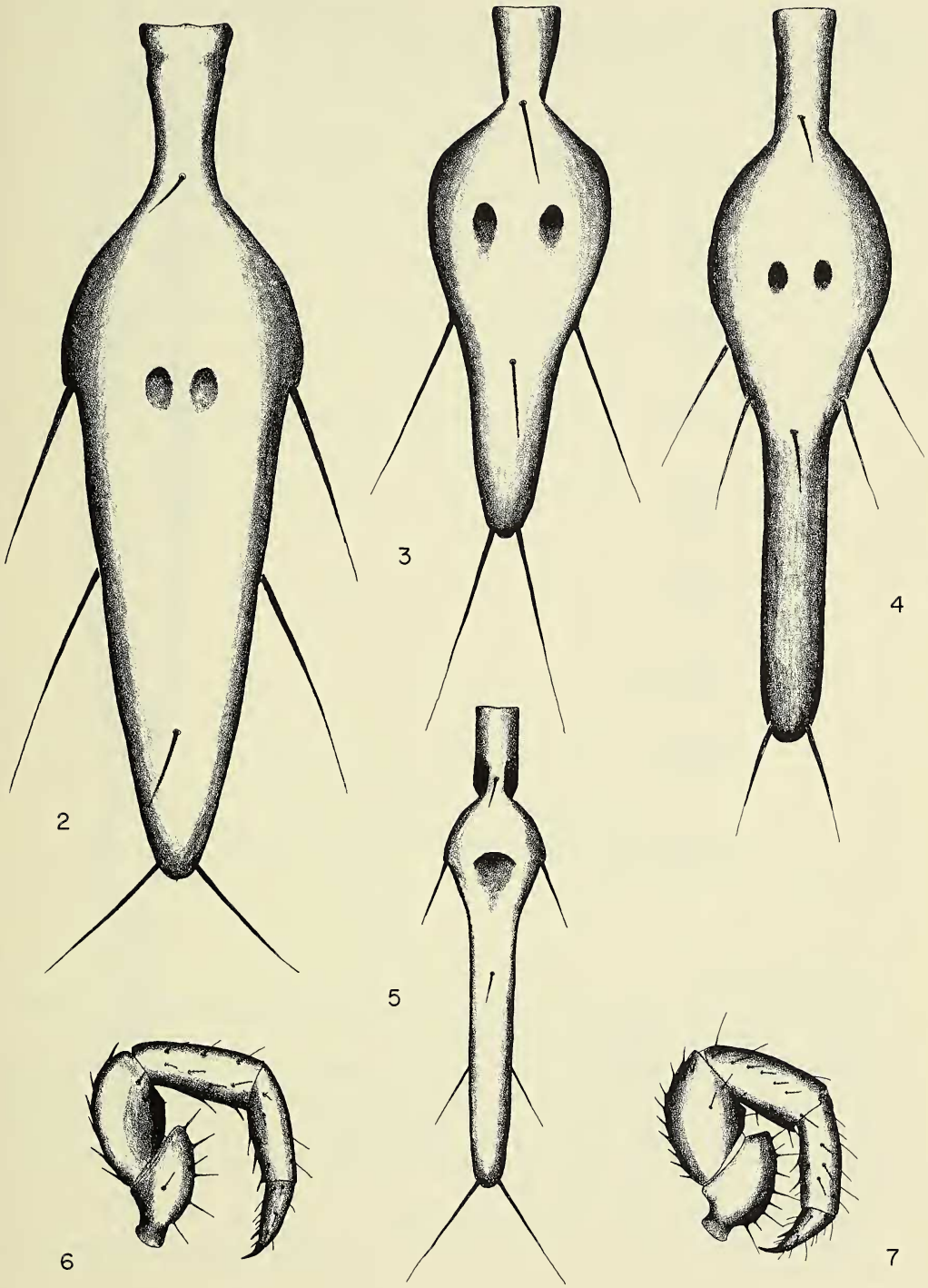
Variation.—The male paratype is smaller than the holotype and exhibits a lesser degree of abdominal attenuation. As was noted in the original description the paratype contained a nematode parasite in the abdominal cavity which may account for its smaller size, but variation of this magnitude is not unusual in other species.

Additional record.—*Yucatán:* Chichén Itzá, June 1948 (C. and M. Goodnight), one female (AMNH, examined).

Schizomus orthoplax Rowland
Figs. 1, 3, 7, 11

Schizomus orthoplax Rowland 1973a: 6, 10-13; Rowland 1973c: 135; Rowland and Reddell 1977: 99, 100.

Description.—Male. Color brownish. Carapace with four pairs of dorsal and two apical setae. Eyespots distinctly round. Anterior sternum with 10 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum lanceolate, with a pair of median pits on otherwise flat dorsal surface. Pedipalpal trochanter slightly produced distally; tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 35-4-7-6-7-7-16. Other leg segment measurements given in Table 3.



Figs. 2-7.–Parts of male schizomids of the *goodnightorum* group: 2-5, dorsal views of flagella: 2, *S. lanceolatus*; 3, *S. orthoplax*; 4, *S. silvino*, 5, *S. goodnightorum*; 6, 7, lateral views of right pedipalps: 6, *S. goodnightorum*; 7, *S. orthoplax*.

Table 2.–Comparisons of the members of the *goodnightorum* group. See the introduction to Rowland and Reddell (1979a) for discussion of characters.

CHARACTER	goodni-ghtorum	orth-oplax	lance-olatus	silvino
DORSAL SETAE	3	4	4	4
STERNAL SETAE	10	10	11	10
EYESPOTS	indis-tinct	distinct	distinct	distinct
SPERMA-THECAE	M 5X L	?	?	M 2X L
CARAPACE LENGTH	.89	1.04	1.42	1.05
LENGTH FEM. FLAGELLUM	.22	?	?	.31
ABDOMINAL ELONGATION	7-12	8-12	7-12	8-12
PIT MALE FLAGELLUM	single	double	double	double

Female unknown.

Type data.–Male holotype taken at Finca Cuauhtemoc, Chiapas, México, 8 May 1950 (C. and M. Goodnight) (AMNH, examined).

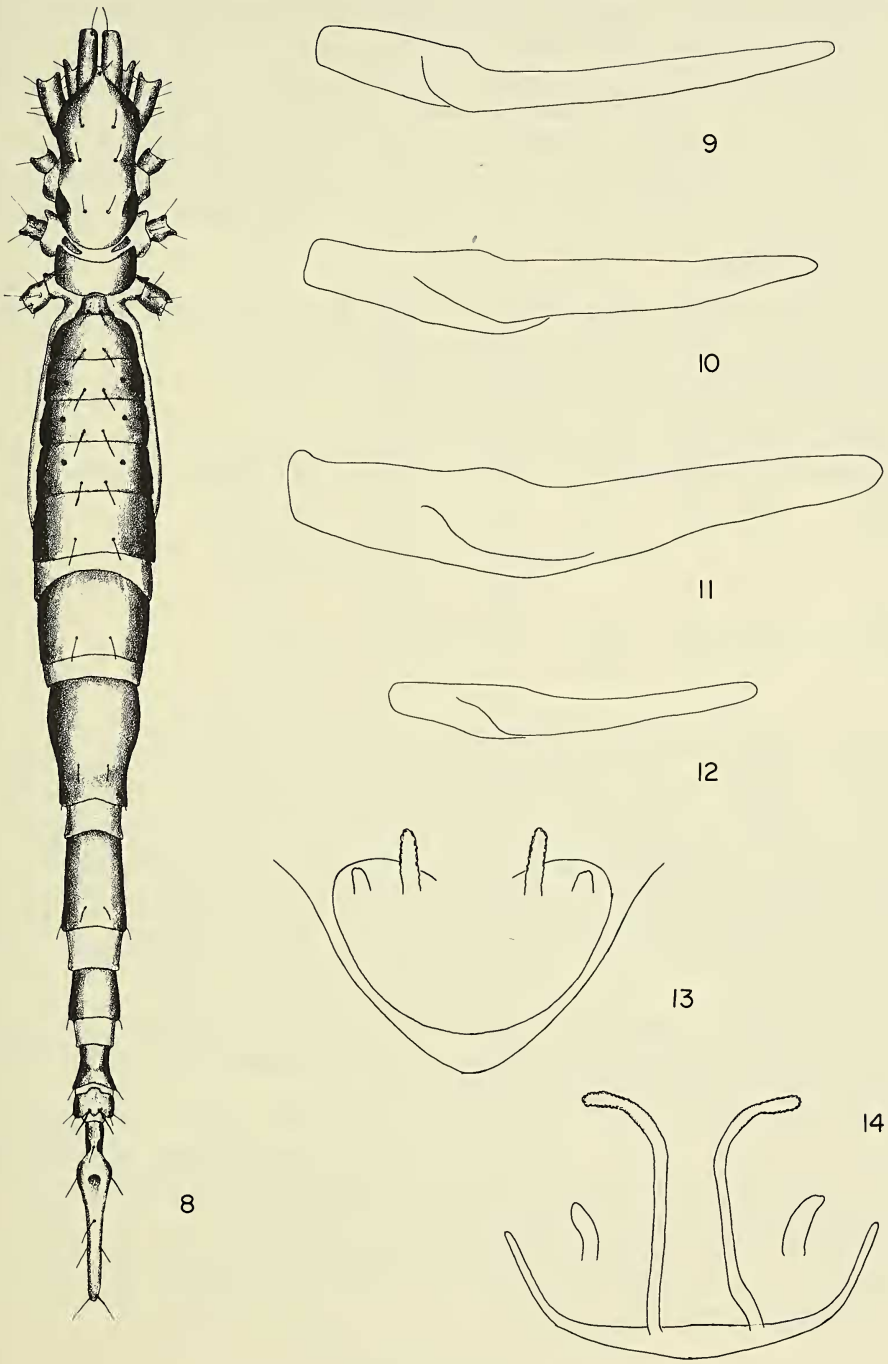
Comparisons.–This species is most similar to *S. silvino* and *S. lanceolatus*. They are best distinguished on the basis of the morphology of the male flagellum. The carapacial lengths also differ among these species. The flagellum is by far the longest in *S. lanceolatus* and by far the shortest in *S. orthoplax* and is apparently intermediate in *S. silvino*. See also under *S. goodnightorum*.

Distribution.–Known only from the type locality.

Additional record.–*Chiapas*: Finca Cuauhtemoc, 8 June 1950 (C. and M. Goodnight), two immatures (AMNH).

Schizomus lanceolatus Rowland
Figs. 1-2, 10

Schizomus lanceolatus Rowland 1975b: 7, 15-16, 17; Rowland and Reddell 1977: 80, 86, 99, 100.



Figs. 8-14.–Parts of schizomids of the *goodnightorum* group: 8, dorsal view of male *S. goodnightorum*, legs and pedipalps past the trochanter omitted; 9-12, lateral views of male flagella: 9, *S. goodnightorum*; 10, *S. lanceolatus*; 11, *S. orthoplax*; 12, *S. silvino*; 13, 14, female spermathecae: 13, *S. silvino*; 14, *S. goodnightorum*.

Description.—Male. Color brownish. Carapace with four pairs of dorsal and two apical setae. Eyespots distinct, irregular. Anterior sternum with 11 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, abdominal segments VII-XII attenuate, segment XII with no evidence of posterodorsal process. Vestigial stigmata slightly darker than sterna. Flagellum lanceolate, with pair of median pits on otherwise flat dorsal surface. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 57-9-9-9-10-9-21. Other leg segment measurements given in Table 3.

Female unknown.

Type data.—Holotype male taken in Cueva del Diablo, near Ciudad Mendoza, Veracruz, México, 7 March 1973 (J. Reddell) (AMNH, examined).

Comparisons.—See under *S. goodnightorum* and *S. orthoplax*.

Distribution.—Known only from the type locality.

Remarks.—This dark species has distinct eyespots and is probably a facultative troglophile. It was collected beneath a rock in the dark zone of Cueva del Diablo.

Schizomus silvino Rowland and Reddell
Figs. 1, 4, 12-13

Schizomus silvino Rowland and Reddell 1977: 80, 81, 86, 96-97, 100.

Description.—Male. Color brownish, pale. Carapace with four pairs of dorsal and two apical setae. Eyespots distinct, irregular. Anterior sternum with 10 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segments VIII-XII attenuate, segment XII with no evidence of posterodorsal process. Vestigial stigmata lighter than sterna. Flagellum extremely elongate, with a pair of median pits on otherwise flat dorsal surface. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 2/5 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 44-6-8-7-8-8-18. Other leg segment measurements given in Table 3.

Female. Flagellum composed of three articles. Median spermathecae two or three times longer than laterals, with both very slightly divergent, but neither expanded distally; medians sclerotized slightly on apical half.

Type data.—Holotype male, allotype female, and three male, six female, and six immature paratypes taken in Gruta de Silvino, 34 km W Puerto Barrios, Izabal, Guatemala, between 20-22 August 1969 (S. and J. Peck) (AMNH, examined).

Comparisons.—See under *S. goodnightorum* and *S. orthoplax*.

Distribution.—Known only from the type locality.

Remarks.—Although this species is paler than most, the presence of distinct eyespots indicates that it is a facultative troglophile.

BRIGGSI GROUP

Description.—The members of this group are characterized by moderate to large size (1.17-1.50 mm carapacial length). The color is usually brownish but may be greenish. The eyespots are indistinct or distinct. The carapace has one or three to four pairs of dorsal and three apical setae. The abdomen is attenuated in males of one species, but not

Table 3.–Measurements (mm) of the species of the *goodnightorum* group: 1, two males, *S. goodnightorum*; 2, one female, *S. goodnightorum*; 3, one male, *S. orthoplax*; 4, one male, *S. lanceolatus*; 5, two males, *S. silvino*; 6, two females, *S. silvino*. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6
Carapace	1.04–1.12	0.89	1.04	1.42	1.11–1.14	1.00–1.05
Flagellum						
Length	1.04	0.22	0.57	0.99	0.70–0.79	0.29–0.31
Width	0.22	–	0.19	0.27	0.20–0.20	–
Leg I						
Femur	1.33–1.67	0.84	1.02	1.80	1.45–1.62	1.05–1.14
Patella	1.55	0.99	1.24	2.34	1.80–2.01	1.26–1.36
Tibia	1.15	0.72	0.85	1.79	1.03–1.36	0.86–0.91
Tarsus-Basitarsus	–	0.60	0.82	1.26	0.97–0.99	0.76–0.77
Leg II						
Femur	0.83–0.93	0.58	0.60	1.15	0.82–0.92	0.71–0.75
Patella	0.40–0.52	0.33	0.31	0.55	0.48–0.51	0.40–0.41
Tibia	0.56–0.63	0.32	0.38	0.82	0.53–0.59	0.40–0.45
Basitarsus	0.51–0.45	0.30	0.38	0.67	0.49–0.53	0.38–0.43
Leg III						
Femur	0.77	0.51	0.53	1.01	0.71–0.79	0.61–0.65
Patella	0.30	0.22	0.20	0.50	0.33–0.36	0.29–0.31
Tibia	0.41	0.26	0.30	0.57	0.41–0.44	0.34–0.36
Basitarsus	0.50	0.33	0.37	0.71	0.50–0.55	0.40–0.47
Leg IV						
Femur	1.16–1.35	0.86	0.94	1.51	1.17–1.31	1.01–1.07
Patella	0.45–0.50	0.40	0.37	0.65	0.51–0.52	0.44–0.46
Tibia	0.80–0.95	0.60	0.64	1.07	0.77–0.86	0.66–0.71
Basitarsus	0.70–0.81	0.50	0.51	0.92	0.70–0.77	0.58–0.64

in others. The males have a posterodorsal abdominal process which is always pointed apically. The flagellum is usually globose, but is long and thin in one species, and usually bears some dorsal modifications. The female flagellum is composed of four articles and is long (0.34-0.54 mm). The female spermathecae are characterized by three, four, or several pairs of short, broad lobes which may or may not be sclerotized apically. The pedipalps may be slightly to extremely or not sexually dimorphic. The trochanter is often produced distally, and the femur, patella, and tibia are often elongated. The tibia in males of all species has either a series of heavy spines or a well-developed spur apposible to the tarsus-basitarsus.

Distribution.–United States: California, Arizona.

Remarks.–See Table 4 for comparisons of the species in the *briggsi* group.

Subordinate taxa.–*Pentapeltis* complex: *S. pentapeltis; briggsi* complex: *S. wessoni, S. borregoensis, S. shoshonensis, S. joshuensis, S. briggsi, S. belkini.*

Schizomus pentapeltis (Cook)
Figs. 15, 23, 27, 38

Hubbardia pentapeltis Cook 1899: 253-354, 261.

Trithyreus pentapeltis: Banks 1900: 422; Hansen and Sörensen 1905: 4, 44, 70; Moles 1917: 1-7; Moles 1921: 11; Kishida 1930: 18; Hilton 1932: 33-34, 45-46; Giltay 1935: 8; Werner 1935: 469; Gertsch 1940: 1; Takashima 1943: 96; Comstock 1948: 18; Kraus 1957: 245; McDonald and

Hogue 1957: 1, 6-7; Briggs and Hom 1966: 270, 273, 274; Hom 1967: 218, 220; Rowland 1971: 304; Rowland 1972a: 69-74; Rowland 1972b: 5, 8; Rowland 1972c: 153, 155, 156, 159; Rowland 1973b: 195, 196, 202.

Schizomus pentapeltis: Mello Leitão 1931: 18; Rowland and Reddell 1979a: 162.

Description (of a male and female topotype).—Male. Color brownish. Carapace with three pairs of dorsal and three apical setae. Metapeltidium split. Eyespots distinct, irregular. Anterior sternum with 13 bifid setae. Abdominal terga I-IV with two setae, V-VI with four setae, IX with two setae, VII-VIII with six setae, segment XII with acutely produced, well-developed posterodorsal process. Abdominal segments VII-XII attenuated. Vestigial stigmata darker than sterna. Flagellum long, lanceolate, with a pair of median depressions. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 63-8-12-12-12-11-28. Other leg segment measurements given in Table 5.

Female. Flagellum composed of four articles. Spermathecae with several small, closely associated lobes, apically sclerotized in localized areas.

Type data.—Two male and one female cotypes taken at Palm Canyon, near Palm Springs, Riverside County, California, 13 February and 6 March 1897 (Hubbard) (USNM, examined).

Comparisons.—*S. pentapeltis* is easily distinguished from the other species of the goup by the elongate flagellum and abdomen of the male. The spermathecal morphology is similar to that of other species, but is characterized by lightly sclerotized apical tubercles. The male pedipalps are not sexually dimorphic as in other Californian species.

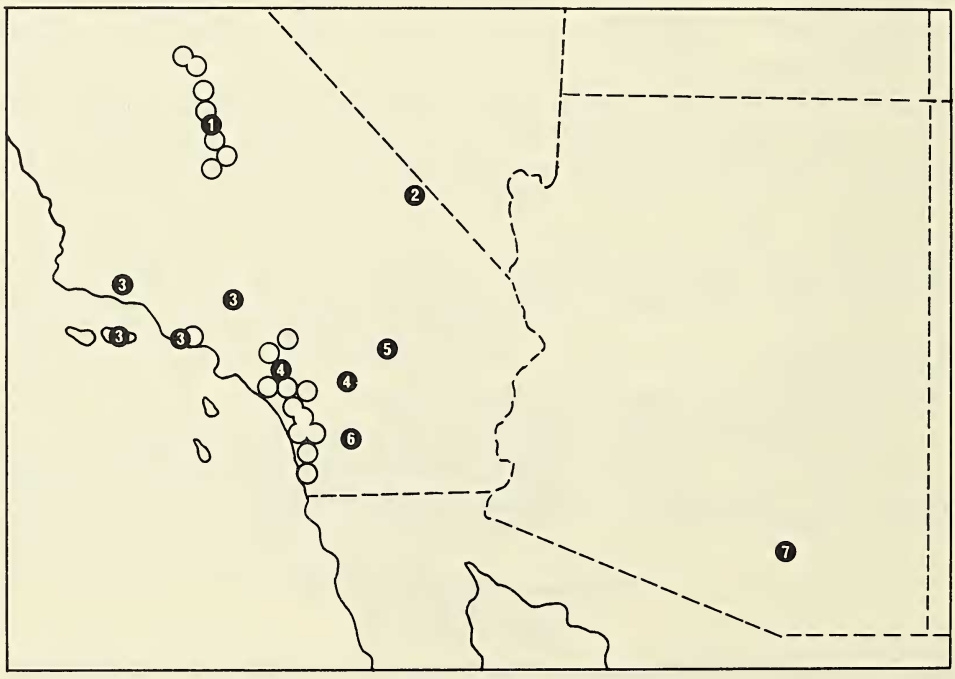


Fig. 15.—Map showing distribution of schizomids of the *briggsi* group: 1, *S. briggsi*; 2, *S. shoshonensis*; 3, *S. belkini*; 4, *S. pentapeltis*; 5, *S. joshuensis*; 6, *S. borregoensis*; 7, *S. wessoni*.

Table 4.–Comparisons of the members of the *briggsi* group. See the introduction to Rowland and Reddell (1979a) for discussion of characters.

CHARACTER	penta-peltis	wessoni	borrego-ensis	shoshon-ensis	joshu-ensis	briggsi	belkini
DORSAL SETAE	3-4	3	3	1	3	3	3
STERNAL SETAE	13	14	13	11	13	13	13
COLOR	brown	brown	brown	brown	brown	green	green
MALE PEDIPALP	short	short	short	long	long	long	long
SPERMA-THECAE	several	3	several	?	4	4	4
CARAPACE LENGTH	1.50	1.30	1.43	1.21	1.41	1.29	1.17
LENGTH FEM. FLAGELLUM	.54	?	.43	.34	.40	.39	.37
ABDOMINAL ELONGATION	7-12	none	none	none	none	none	none
SHAPE MALE FLAGELLUM	elongate	tril-obate	penta-gonal	trian-gular	hexa-gonal	hexa-gonal	hexa-gonal
PIT MALE FLAGELLUM	double	absent	absent	double	double	single	double

Distribution.–This species is known from the coastal foothills of southernmost California west to the coast and north into the San Jacinto Mountains, and Los Angeles Basin. An apparently isolated population occurs at an oasis in Palm Canyon on the northeast slope of the San Jacinto Mountains.

Remarks.–This, the first schizomid described from the New World, has been found to be widespread in California and may occur in Baja California, México, as well. Rowland (1972a) reported the brooding habits and early development of this species.

Variation.–As in other species with an elongated abdomen in the males, the abdomen and flagellum seem to vary considerably in the extent to which they are attenuated. Rarely specimens occur which have setational differences from the above description. Four pairs of dorsal carapacial setae may occur, as well as may additional abdominal tergal setae.

Additional records.—*California*: Riverside County: Andreas Canyon, 3 March 1956 (V. Roth), one male, one female, two immatures (AMNH), 25-27 March 1960 (W. Gertsch, W. Ivie, Schrammel, V. Roth), six males, 25 females, 16 immatures (AMNH), 6 April 1966 (T. Briggs, K. Hom), four immatures (CAS), 10 January 1971 (J. Rowland), one male, five females, five immatures (TTU), 14 January 1971 (J. Rowland), two males, six females, three immatures (MCZ), 23 March 1971 (J. Rowland), four females, four immatures (LACM); Snow Creek Canyon, 20 March 1954 (collector unknown), three females, one immature (AMNH), 13 April 1955 (J. Belkin), three females, eight immatures (AMNH); Riverside, 26 March 1960 (V. Roth), one male, one female (AMNH); Citrus Experiment Station, Riverside, 21 February 1957 (E. Schlinger), one male (AMNH); near Citrus Experiment Station, Riverside, 1 December 1925 (J. Chamberlin), two males, one female (AMNH); Winchester, 22 January 1967 (W. Icenogle), one male (LACM), 24 January 1971 (W. Icenogle), one male, three females, one immature (LACM), 7 February 1971 (W. Icenogle), one female (TTU); Orange County: 11.4 mi. SW Lower San Juan Camp, Cleveland National Forest, oak litter, 20 December 1966 (A. Jung, D. Owyang, K. Hom), one male, five females, five immatures (CAS); San Clemente, 27 December 1966 (W. Lum), one immature (CAS); San Diego County: San Diego, March 1970 (B. Kaston), two males, one immature (LACM); El Cajon, 2 March 1969 (collector unknown), one male, two females (LACM), 1970 (S. Lewis), two males, one female (LACM); Dripping Springs, near Vail Lake, 6 March 1971 (J. Rowland), two males, four females, one immature (AMNH).

Schizomus wessoni (Chamberlin)

Figs, 15, 22, 26, 31

Trithyreus wessoni Chamberlin 1939: 123-124; Gertsch 1940: 1; Takashima 1943: 97; Kraus 1957: 245; McDonald and Hogue 1957: 1, 6; Rowland 1971: 304; Rowland 1972c: 154.
Schizomus wessoni: Rowland and Reddell 1979a: 162.

Description.—Male. Color brownish. Carapace with three pairs of dorsal and three apical setae. Eyespots small, indistinct. Anterior sternum with 14 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with acutely produced, well-developed posterodorsal process. Vestigial stigmata darker than sterna. Flagellum trilobate, the median lobe arising above the basal two. Pedipalpal trochanter produced distally; thick spines from tibia appose tarsus-basitarsus; tarsal-basitarsal spurs about 1/6, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the follow approximate proportions: 37-6-7-7-8-9-21. Other leg segment measurements given in Table 5.

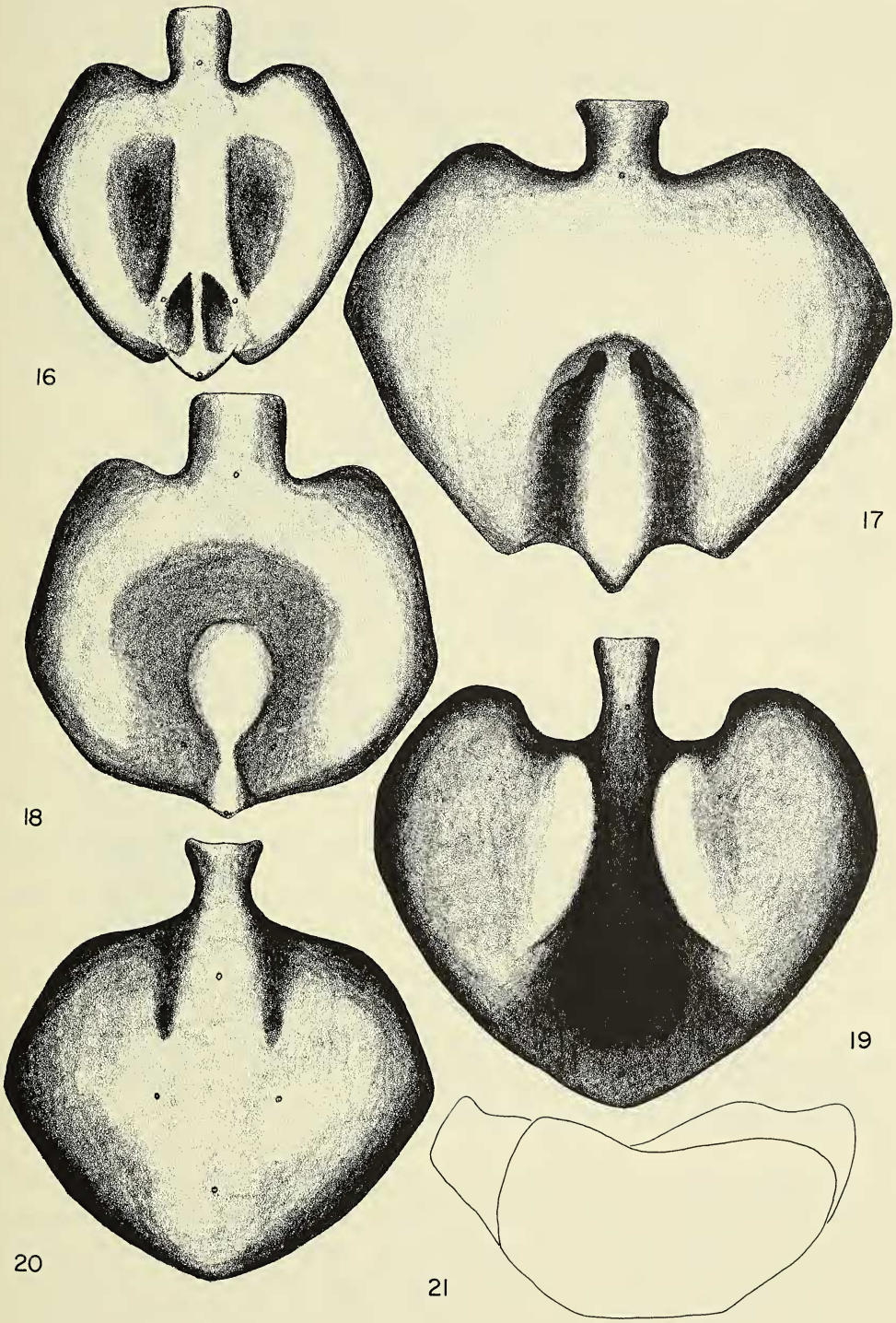
Female. Flagellum composed of four articles. Spermathecae composed of three pairs of small, broad lobes, each with minute terminal elevations, but with no special sclerotization.

Type data.—Male holotype taken "under a stone shaded by small bushes and trees growing along the Santa Cruz River" near Tucson, Arizona, April 1938 (R. Wesson) (AMNH, examined).

Comparisons.—Males may be distinguished from all other members of the *briggsi* group in having a distinctly trilobate flagellum. The pedipalps are very similar in development to those of *S. borregoensis*, especially in the development of the mesal tibial spurs which appose the tarsus-basitarsus. The male flagellum of *S. borregoensis* is distinctly pentagonal rather than trilobed as in *S. wessoni*. The presence of only three pairs of spermathecal lobes in *S. wessoni* serves to distinguish females from other species of the group.

Distribution.—Known only from near Tucson, Arizona.

Remarks.—Long-term drying of the Santa Cruz River due to agricultural activities upstream from Tucson may have totally eliminated *S. wessoni* from the type locality and



Figs. 16-21.–Male flagella of the *briggsi* group: 16-20, dorsal views: 16, *S. belkini*; 17, *S. joshuensis*; 18, *S. briggsi*; 19, *S. shoshonensis*; 20, *S. borregoensis*; 21, lateral view of *S. briggsi*.

Table 5.–Measurements (mm) of four species of the *briggsi* group: 1, three males, *S. pentapeltis*; 2, three females, *S. pentapeltis*; 3, one male, *S. wessoni*; 4, one female, *S. wessoni*; 5, two males, *S. borregoensis*; 6, one female, *S. borregoensis*; 7, one male *S. shoshonensis*; 8, one female, *S. shoshonensis*. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6	7	8
Carapace	1.49–1.54	1.42–1.59	1.30	1.24	1.38–1.46	1.40	1.25	1.18
Flagellum								
Length	1.39–1.54	0.52–0.57	0.75	–	0.59–0.62	0.43	0.62	0.34
Width	0.45–0.46	–	0.66	–	0.61–0.62	–	0.69	–
Leg I								
Femur	2.05–2.31	1.41–1.63	1.36	–	1.82–1.83	1.39	1.57	1.23
Patella	2.56–3.28	1.68–1.95	1.60	–	2.25–2.32	1.65	1.85	1.42
Tibia	2.04–2.39	1.36–1.57	–	–	1.74–1.77	1.22	1.48	1.11
Tarsus-Basitarsus	1.30–1.59	1.08–1.18	–	–	1.19–1.30	1.14	1.14	0.99
Leg II								
Femur	1.18–1.37	1.00–1.15	0.96	0.96	1.14–1.17	1.00	1.02	0.88
Patella	0.69–0.78	0.55–0.67	0.51	0.53	0.66–0.68	0.56	0.59	0.51
Tibia	0.81–0.93	0.68–0.72	0.64	0.64	0.84–0.87	0.66	0.69	0.56
Basitarsus	0.69–0.78	0.55–0.65	0.54	0.56	0.65–0.67	0.55	0.62	0.50
Leg III								
Femur	1.05–1.15	0.90–1.09	0.85	0.90	1.03–1.07	0.91	0.92	0.79
Patella	0.51–0.59	0.46–0.51	0.39	0.45	0.51–0.52	0.46	0.45	0.39
Tibia	0.65–0.75	0.57–0.64	0.55	0.55	0.70–0.72	0.56	0.57	0.47
Basitarsus	0.75–0.85	0.64–0.70	0.59	0.60	0.71–0.74	0.61	0.68	0.54
Leg IV								
Femur	1.53–1.80	1.33–1.51	1.21	1.31	1.54–1.59	1.34	1.39	1.21
Patella	0.74–0.79	0.65–0.73	0.55	0.60	0.69–0.70	0.65	0.61	0.57
Tibia	1.15–1.30	0.99–1.14	0.94	0.93	1.18–1.22	1.02	1.01	0.85
Basitarsus	1.01–1.15	0.86–1.00	0.79	0.80	0.96–0.98	0.83	0.91	0.76

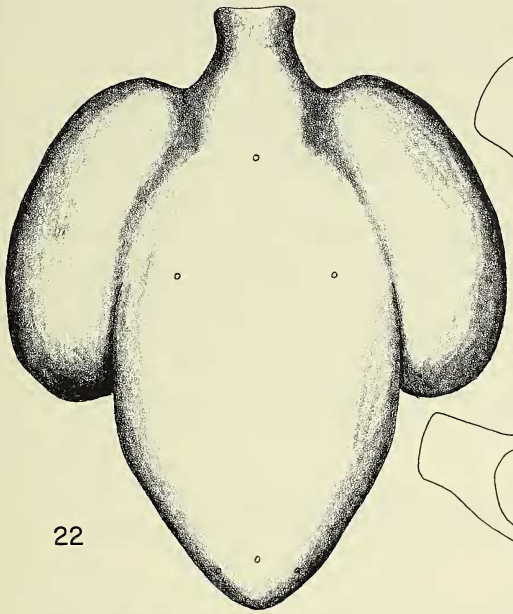
perhaps altogether. A relict population 20 miles south of Ajo, Arizona, may represent an earlier isolated relative of this species.

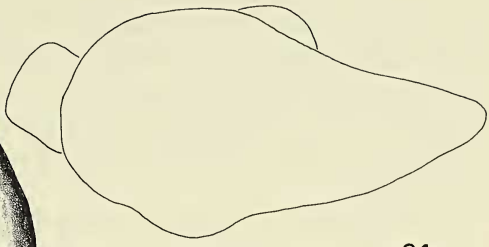
Additional record.–Arizona: Tucson, date unknown (Griswold), one female (AMNH, examined).

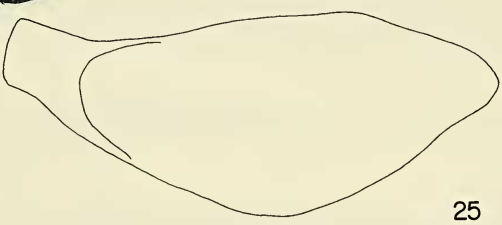
Schizomus borregoensis (Briggs and Hom)
Figs. 15, 20, 25, 28, 34-35

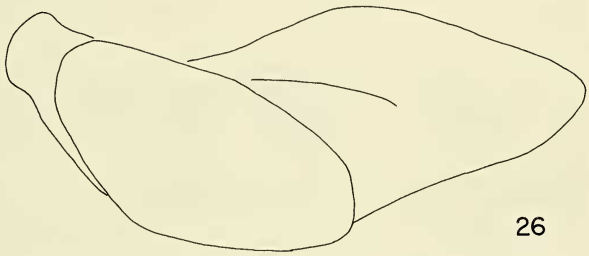
Trithyreus borregoensis Briggs and Hom 1966: 270-273; Rowland 1971: 304, 308-309; Rowland 1972b: 5, 8; Rowland 1972c: 153, 155, 156, 159.
Schizomus borregoensis: Rowland and Reddell 1979a: 163.

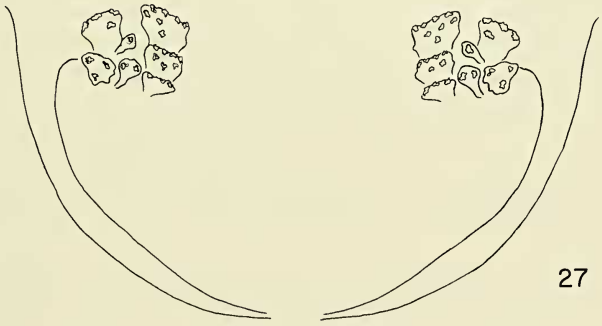
Description.–Male. Color brownish. Carapace with three pairs of dorsal and three apical setae. Eyespots indistinct. Anterior sternum with 13 bifid setae. Abdominal terga I-V with two setae, terga VI-IX with four setae, segment XII with acutely produced, well-developed posterodorsal process. Vestigial stigmata darker than sterna. Flagellum pentagonal, with no dorsal relief. Pedipalpal trochanter produced distally; thick spines from tibia appose tarsus-basitarsus; tarsal-basitarsal spurs about 1/6, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 51-10-10-10-12-11-24. Other leg segment measurements given in Table 5.











Figs. 22-27.–Parts of schizomids of the *briggsi* group: 22-26, male flagella: 22, 23, dorsal views: 22, *S. wessoni*; 23, *S. pentapeltis*; 24-26, lateral views: 24, *S. shoshonensis*; 25, *S. borregoensis*; 26, *S. wessoni*; 27, female spermathecae of *S. pentapeltis*.

Female. Flagellum composed of four articles. Pedipalpal trochanter not as acutely produced. Spermathecae composed of several pairs of lobes which are apically elaborated with many minute terminal elevations, no special sclerotization.

Type data.—Male holotype, female allotype, and immature paratype taken "under rocks in palm and sycamore debris near stream" in Borrego Palm Canyon, Anza Borrego State Park, San Diego County, California, 4 April 1966 (T. Briggs, K. Hom) (CAS, examined).

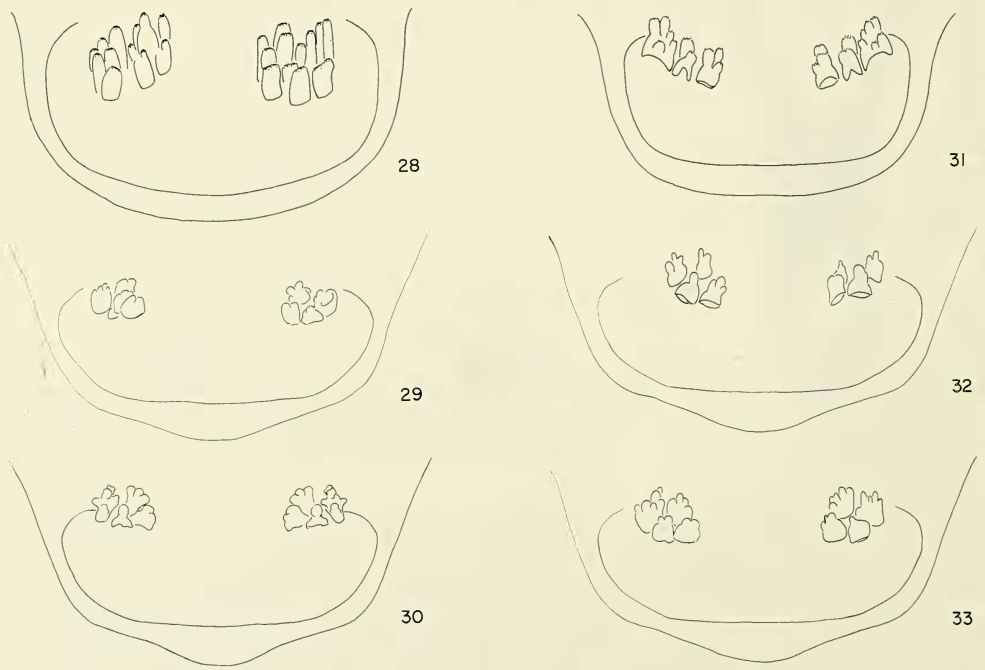
Comparisons.—This species does not have the extremely dimorphic pedipalps seen in other California species with the exception of *S. pentapeltis*. The flagellum completely lacks any dorsal relief in contrast to other *briggsi* group members. See also under *S. wessoni*.

Distribution.—Known only from the type locality.

Additional record.—*California*: San Diego County: Borrego Palm Canyon, 12 January 1971 (J. Rowland, T. Moisi), two males, one female (AMNH).

Schizomus shoshonensis (Briggs and Hom)
Figs. 15, 19, 24

Trithyreus shoshonensis Briggs and Hom 1972: 1-7.
Schizomus shoshonensis: Rowland and Reddell 1977: 80; Rowland and Reddell, 1979a: 163.



Figs. 28-33.—Female spermathecae of the *briggsi* group: 28, *S. borregoensis*; 29, *S. joshuensis*; 30, *S. briggsi*; 31, *S. wessoni*; 32, 33, *S. belkini*: 32, from the type locality; 33, from Santa Cruz Island.

Description.–Male. Color brownish. Carapace with one pair of dorsal and three apical setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with well-developed, acute posterodorsal process. Vestigial stigmata slightly darker than sterna. Flagellum heart shaped, with pair of paramedial elevations separated by a wide median depression which deepens and widens distally. Pedipalpal trochanter produced slightly distally; all segments elongate; tibia with a spur apposible to tarsus-basitarsus; tarsal-basitarsal spurs about 1/6, claw about 2/5 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 48-7-10-9-9-9-23. Other leg segment measurements given in Table 5.

Female. Carapace with three pairs of dorsal setae. Flagellum composed of four articles. Spermathecae not dissected, but appearing typical for the group as seen through the lightly sclerotized genital sternum.

Type data.–Male holotype and female allotype taken in Upper Shsoshone Cave, near Shoshone, Inyo County, California, 28 December 1971 (W. Rauscher, E. Fogarino, T. Briggs) (CAS, examined).

Comparisons.–This is the only species in the *briggsi* group with only one pair of dorsal carapacial setae in the male. Its closest relatives, with which it bears obvious similarities, are more western. Also see under *S. belkini*.

Distribution.–Known only from the type locality.

Remarks.–This species is unquestionably troglobitic, as was convincingly pointed out by Briggs and Hom (1972). It is likely that other populations of this or related species may occur in nearby caves. The presence of eyespots indicates that it is probably a recent relict.

Schizomus joshuensis (Rowland)

Figs. 15, 17, 29, 40

Trithyreus joshuensis Rowland 1971: 304-308; Briggs and Hom 1972: 2; Rowland 1972b: 3, 4, 5, 7; Rowland 1972c: 153, 155, 156, 159.
Schizomus joshuensis: Rowland and Reddell 1979a: 163.

Description.–Male. Color brownish. Carapace with three pairs of dorsal and three apical setae. Eyespots indistinct. Anterior sternum with 13 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with acutely produced well-developed posterodorsal process. Vestigial stigmata darker than sterna. Flagellum roughly hexagonal, with pair of distinct median depressions flanking slight median ridge. Pedipalpal trochanter, femur, patella, and tibia extremely elongate; the tibia with a mesal spur apposible to the tarsus-basitarsus; tarsal-basitarsal spurs about 1/6, claw about 1/4 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 51-7-9-9-10-11-25. Other leg segment measurements given in Table 6.

Female. Flagellum composed of four articles. Spermathecae composed of four pairs of small, broad lobes, each with minute terminal elaborations, no special sclerotization.

Type data.–Holotype male and allotype female taken at Forty-nine Palms, Joshua Tree National Monument, San Bernardino County, California, 20 February 1970 (J. Rowland and D. Harris) (AMNH, examined); paratype male and female taken at Forty-nine Palms, 22 February 1970 (J. and C. Rowland) (AMNH, examined); paratype male and female taken at Forty-nine Palms, 30 December 1970 (J. Rowland and P. Brashier) (AMNH, examined).

Table 6.–Measurements (mm) of three species of the *briggsi* group: 1, four males, *S. joshuensis*; 2, four females, *S. joshuensis*; 3, five males, *S. briggsi*; 4, five females, *S. briggsi*; 5, four males, *S. belkini*; 6, four females, *S. belkini*. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6
Carapace	1.36–1.48	1.39–1.47	1.22–1.32	1.22–1.40	1.13–1.25	1.11–1.24
Flagellum						
Length	0.63–0.65	0.38–0.44	0.55–0.60	0.38–0.40	0.54–0.57	0.34–0.39
Width	0.65–0.68	–	0.51–0.56	–	0.45–0.52	–
Leg I						
Femur	1.52–1.75	1.34–1.53	1.22–1.35	1.05–1.25	1.14–1.31	1.02–1.13
Patella	1.96–2.16	1.60–1.86	1.62–1.70	1.31–1.55	1.27–1.55	1.14–1.30
Tibia	1.50–1.70	1.22–1.45	1.14–1.28	1.00–1.03	0.98–1.13	0.90–0.98
Tarsus-Basitarsus	1.12–1.27	1.01–1.12	0.82–1.03	0.82–0.98	0.93–0.97	0.82–0.87
Leg II						
Femur	1.02–1.17	0.97–1.10	0.72–0.92	0.80–0.84	0.79–0.88	0.73–0.84
Patella	0.59–0.67	0.52–0.61	0.36–0.50	0.45–0.52	0.44–0.53	0.45–0.52
Tibia	0.69–0.77	0.64–0.75	0.55–0.63	0.51–0.54	0.48–0.55	0.48–0.51
Basitarsus	0.58–0.69	0.56–0.65	0.46–0.53	0.42–0.52	0.45–0.52	0.40–0.48
Leg III						
Femur	0.95–1.05	0.89–1.03	0.70–0.74	0.65–0.79	0.70–0.78	0.66–0.76
Patella	0.41–0.53	0.40–0.46	0.28–0.36	0.35–0.38	0.34–0.38	0.32–0.40
Tibia	0.55–0.66	0.51–0.63	0.41–0.46	0.43–0.45	0.38–0.42	0.32–0.41
Basitarsus	0.64–0.77	0.62–0.71	0.46–0.57	0.46–0.55	0.45–0.54	0.43–0.51
Leg IV						
Femur	1.44–1.56	1.32–1.52	1.18–1.26	1.15–1.30	1.12–1.25	1.05–1.16
Patella	0.64–0.73	0.59–0.70	0.50–0.56	0.45–0.57	0.55–0.65	0.51–0.60
Tibia	1.02–1.15	0.98–1.09	0.83–0.95	0.81–0.95	0.77–0.85	0.73–0.80
Basitarsus	0.94–1.04	0.85–0.95	0.70–0.82	0.68–0.81	0.70–0.78	0.65–0.75

Comparisons.–This species is usually larger than other species in the group, with the exception of *S. pentapeltis*. Details of the male flagellum serve to distinguish it further from related forms. Also see under *S. belkini*.

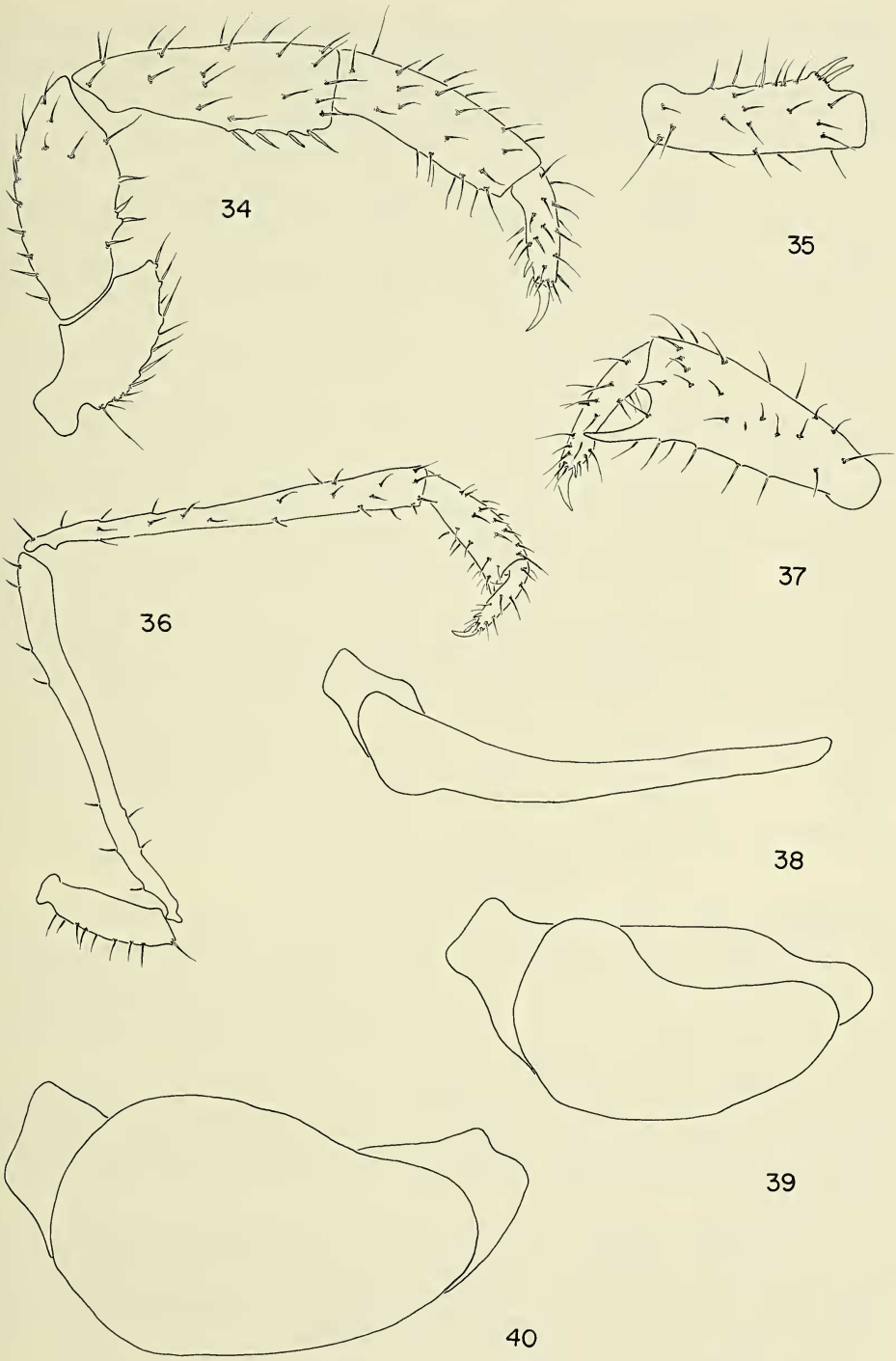
Distribution.–Known only from the type locality.

Remarks.–Search of other palm oases in Joshua Tree National Monument has failed to produce schizomids, but if found they should closely resemble *S. joshuensis*. The type locality and possibly the only suitable habitat for this species is maintained by a fault-zone spring, which, if caused to go dry, would presumably eliminate this species. Lost Palm Oasis, another similar oasis in Joshua Tree National Monument, has been drained and made uninhabitable for this and perhaps other interesting relicts. This species has been collected in relatively low temperatures, where water was crystallized on the soil surface. In such cases it has been collected on the vertical face of partially exposed rocks.

Additional records.–*California*: San Bernardino County: Forty-nine Palms, Joshua Tree National Monument, 20 February 1970 (J. Rowland), two males, two females, one immature (MCZ), 22 February 1970 (J. Rowland, D. Harris), four females, two immatures (CAS), 30 December 1970 (J. Rowland), one female (TTU).

Schizomus briggsi (Rowland)
Figs. 15, 18, 21, 30, 36-37

Trithyreus belkini: Hom 1967: 216-220 [misidentification].
Trithyreus briggsi Rowland 1972b: 1-9; Rowland 1972c: 156; Dumitresco 1977: 151.
Schizomus briggsi: Rowland and Reddell 1979a: 163.



Figs. 34-40.–Parts of male schizomids of the *briggsi* group: 34-37, pedipalps: 34, 35, *S. borregoensis*: 34, right, lateral view: 35, right, dorsal view; 36, 37, *S. briggsi*: 36, right, lateral view; 37, right, mesal view of tibia and tarsus-basitarsus only; 38-40, lateral view of flagella: 38, *S. pentapeltis*; 39, *S. belkini*; 40, *S. joshuensis*.

Table 7.–Measurements of the species of *Schizomus* not assigned to groups: 1, two males, *S. infernalis*; 2, two females, *S. infernalis*; 3, one female, *Schizomus* sp. from Sierra Nevada, Colombia; 4, two males, *S. troglobius*; 5, three females, *S. troglobius*; 6, two males, *S. armasi*; 7, three females, *S. armasi*. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6	7
Carapace	1.14–1.18	1.13–1.17	1.17	1.05–1.07	1.19–1.24	0.85–0.87	0.84–0.86
Flagellum							
Length	0.40–0.41	0.25–0.27	0.31	0.32–0.33	0.29–0.29	0.27–0.27	0.19–0.21
Width	0.23–0.23	–	–	0.16–0.16	–	0.22–0.22	–
Leg I							
Femur	1.05–1.07	0.86–0.94	1.08	1.42–1.51	1.39–1.43	0.80–0.85	0.68–0.73
Patella	1.16–1.30	1.04–1.15	1.26	1.78–1.86	1.64–1.71	0.96–1.03	0.80–0.85
Tibia	0.95–0.95	0.78–0.82	0.93	1.31–1.35	1.27–1.29	0.72–0.75	0.58–0.62
Tarsus-Basitarsus	0.78–0.82	0.70–0.73	0.83	1.01–1.02	0.98–1.00	0.63–0.65	0.57–0.58
Leg II							
Femur	0.74–0.82	0.63–0.69	0.76	0.91–0.93	0.95–0.98	0.54–0.55	0.48–0.52
Patella	0.43–0.55	0.35–0.41	0.45	0.47–0.48	0.47–0.50	0.30–0.33	0.26–0.30
Tibia	0.44–0.50	0.41–0.43	0.44	0.63–0.63	0.62–0.65	0.32–0.35	0.29–0.31
Basitarsus	0.41–0.43	0.35–0.35	0.45	0.54–0.55	0.52–0.55	0.32–0.32	0.27–0.29
Leg III							
Femur	0.65–0.69	0.58–0.60	0.67	0.79–0.81	0.77–0.83	0.40–0.47	0.43–0.45
Patella	0.29–0.35	0.25–0.27	0.31	0.35–0.35	0.36–0.40	0.21–0.22	0.21–0.22
Tibia	0.27–0.35	0.29–0.30	0.34	0.48–0.49	0.51–0.53	0.25–0.27	0.22–0.24
Basitarsus	0.42–0.42	0.34–0.38	0.46	0.39–0.60	0.57–0.58	0.31–0.32	0.28–0.29
Leg IV							
Femur	1.04–1.04	0.92–0.95	1.11	1.30–1.32	1.32–1.34	0.72–0.85	0.70–0.76
Patella	0.51–0.54	0.41–0.46	0.50	0.51–0.53	0.52–0.57	0.34–0.35	0.33–0.35
Tibia	0.69–0.72	0.60–0.65	0.76	0.89–0.89	0.94–0.96	0.52–0.53	0.48–0.50
Basitarsus	0.60–0.65	0.50–0.59	0.67	0.80–0.82	0.80–0.83	0.46–0.61	0.41–0.43

Description.–Male. Color greenish brown. Carapace with three pairs of dorsal and three apical setae. Metapeltidium split. Eyespots indistinct. Anterior sternum with 13 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with acutely produced, well-developed posterodorsal process. Vestigial stigmata darker than sterna. Flagellum roughly hexagonal, with vague median depression followed by two elevations in line. Pedipalpal trochanter, femur, patella, and tibia extremely elongate; the tibia with a mesal spur apposible to tarsus-basitarsus; tarsal-basitarsal spurs about 1/6, claw about 1/4 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 43-6-6-8-8-9-22. Other leg segment measurements given in Table 6.

Female. Flagellum composed of four articles. Spermathecae composed of four pairs of small, broad lobes, each with minute terminal elevations, with no special sclerotization.

Type data.–Holotype male and allotype female taken on the north face of Rocky Hill, 2.7 mi. E Exeter (1500 ft.), Tulare County, California, 28 January 1971 (P. and J. Rowland) (AMNH, examined).

Comparisons.–*S. briggsi* is most similar to *S. joshuensis* and *S. belkini*, but is smaller in almost every respect than *S. jsohuensis*. It is easily distinguished from *S. belkini* by the abbreviation of the convex longitudinal ridge on the dorsal aspect of the male flagellum. In *S. belkini* the ridge is broad and extends from the base to the tip of the flagellum, whereas in *S. briggsi* the ridge is narrow and extends from near the middle of the

flagellum to the tip. *S. joshuensis* also lacks a complete ridge, but differs from *S. briggsi* in having two lateral pits at the base of the ridge whereas *S. briggsi* has none.

Distribution.–This species is known from near Academy, Fresno County, south to Fountain Springs, Tulare County, California, on scattered rock outcroppings along the west face of the Sierra Nevada foothills.

Remarks.–*S. briggsi* is the northernmost New World schizomid. Its occurrence is seasonal, being abundant in winter and early spring, but apparently disappearing as the temperatures increase and humidities decrease. As with *S. joshuensis*, and perhaps other *briggsi* group species, *S. briggsi* has been found in relatively cold weather. K. Hom (pers. comm.) reported that he has collected this species under rocks with snow on the surrounding ground. Such temperature adaptations are not characteristic of schizomids in general.

Additional records.–*California*: Fresno County: 7 mi. E. Academy, 16 April 1967 (T. Briggs), six adults (CAS); Squaw Valley, 23 March 1941 (S. Mulaik), four females (AMNH); 7 mi. N Piedra, 21 January 1967 (T. Briggs), one adult (TTU); 1.6 mi. SW Piedra, 21 January 1967 (T. Briggs), one adult (TTU), 21 January 1967 (T. Briggs, A. Jung, W. Lum, V. Lee, G. Leung, M. Wong, K. Hom), 21 adults (LACM); Tulare County: north face of Rocky Hill, 2.7 mi. E Exeter, 21 January 1971 (J. and P. Rowland), 21 adults (TTU), 28 January 1971 (J. and P. Rowland), 40 adults (LACM, AMNH, CAS), 5 January 1972 (J. and P. Rowland), five adults (TTU); north face of Rocky Hill, 2.1 mi. E town of Rocky Hill, 19 December 1966 (T. Briggs, V. Lee, K. Hom), 22 adults (MCZ); northwest face of Rocky Hill, 1.4 mi. E town of Rocky Hill, 22 January 1967 (T. Briggs, A. Jung, W. Lum, K. Hom), 18 adults (TTU); 12 mi. NE Hammond, 21 March 1941 (S. Mulaik), one adult (AMNH); 5 mi. NE Lemoncove, 20 March 1941 (S. Mulaik), three adults (AMNH); hill, 2 mi. SE Ivanhoe, 18 December 1966 (T. Briggs), two adults (CAS); 9 mi. N Woodlake, 22 March 1941 (S. Mulaik), three females (AMNH); hill, 3 mi. E Lindsay, 19 December 1966 (T. Briggs, V. Lee, K. Hom), ten adults (MCZ); 6.3 mi. E Fountain Spring, 19 March 1967 (T. Briggs), one adult (TTU); 7 mi. E Fountain Spring, 19 March 1967 (P. Lum, V. Lee, K. Hom), 24 adults (MCZ).

Schizomus belkini (McDonald and Hogue)
Figs. 15-16, 32-33, 39

Trithyreus belkini McDonald and Hogue 1957: 1-7; Briggs and Hom 1966: 270, 273-274; Hom 1967: 216-220; Rowland 1971: 304, 308-309; Briggs and Hom 1972: 2; Rowland 1972b: 1, 4, 5, 7, 8; Rowland 1972c: 153, 155, 156, 158, 159.
Schizomus belkini: Rowland and Reddell 1979a: 162.

Description.–Male. Color brownish. Carapace with three pairs of dorsal and three apical setae. Eyespots indistinct. Anterior sternum with 13 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with acutely produced, well-developed posterodorsal process. Vestigial stigmata darker than sterna. Flagellum roughly hexagonal, with a pair of vague median depressions divided by a wide median ridge. Pedipalpal trochanter, femur, patella, and tibia extremely elongate; the tibia with a mesal spur apposible to tarsus-basitarsus; tarsal-basitarsal spurs about 1/6, claw about 1/4 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 42-5-7-7-7-8-20. Other leg segment measurements given in Table 6.

Female. Flagellum composed of four articles. Spermathecae composed of four pairs of small, broad lobes, each with minute terminal elevations, no special sclerotization.

Type data.–Holotype male, allotype female, and one male and three female paratypes taken at Crater Camp, Santa Monica Mountains, Los Angeles County, California, 21 March 1953, in oak humus (J. Belkin, R. Schick) (AMNH, examined).

Comparisons.—This species is generally the smallest of the members of the *briggsi* group. This species may be separated from *S. joshuensis* and *S. briggsi*, its closest relatives, by the details of the male flagellum.

Distribution.—This species is known from the Santa Monica, Santa Ynez, and San Gabriel Mountains on mainland southern California, and on Santa Cruz Island off its coast.

Remarks.—The widely disjunct populations indicate that this species has probably been restricting its range since xerothermic conditions have prevailed in southern California, except for a narrow moist corridor along the coastal foothills, which provides an avenue for northward dispersal. As in other members of this group, this species has only been found during winter and early spring months; it apparently retreats into subterranean habitats in warmer, drier weather.

Additional records.—*California*: Los Angeles County: Santa Monica Mountains: 4.7 mi. N Topanga Beach, sycamore litter, 27 December 1966 (A. Jung, K. Hom), two males (MCZ), 7 April 1966 (T. Briggs, A. Jung, K. Hom), one male, one female, one immature (CAS); Topanga Canyon, 21 March 1953 (J. Belkin, R. Schick), one male, three females (AMNH), 19 December 1965 (T. Briggs, D. Owyang), one female (CAS), 29 March 1952 (R. Schick), one female, two immatures (AMNH), 27 February 1952 (J. Belkin, W. McDonald), two females, six immatures (AMNH); Malibu Canyon: Tapia Park, 4 April 1954 (L. Moskowski), one immature (AMNH), 7 March 1971 (J. Rowland, P. Brashier), two females, one immature (TTU), 16 February 1970 (J. Rowland, M. Brand), one male, one female, one immature (CAS); Santa Monica Mountains, April 1953 (R. Schick), one female, two immatures (AMNH); San Gabriel Mountains: Eaton Canyon, 28 February 1967 (M. Thompson), one immature (LACM), 30 March 1968 (J. Rowland, B. Firstman), two males, three females, one immature (AMNH); Santa Barbara County: Ose Canyon, Santa Ynez Mountains (=Oso Canyon, San Rafael Mountains), 26 December 1943 (W. S. Ross), one female (CAS); Santa Cruz Island, April 1913 (collector unknown), one male, one female (MCZ); Santa Cruz Island Field Station, 19 December 1967 (K. Hom), one male, two females, one immature (CAS); Raven's Wood, Cañada Del Puerto Canyon, 21 December 1967 (T. Briggs, A. Jung, K. Hom), one male, one female, one immature (CAS).

UNPLACED SPECIES

The following four taxa present considerable difficulties in their proper placement and are, therefore, not placed in any of the species groups discussed above.

Schizomus troglobius, new species
Figs. 41, 44, 48

Description.—Male. Color plae brownish. Carapace with three pairs of dorsal, the medians the smallest, and two apical setae. Eyespots absent. Anterior sternum with 11 bifid setae. Abdominal terga I-VII with two setae, VIII-IX with four setae, abdominal segments X-XII slightly elongated, segment XII without evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum laterally compressed, with complex sculpturing. Pedipalpal trochanter slightly produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 37-7-10-7-9-10-22. Other leg segment measurements given in Table 7.

Female. Flagellum composed of three articles. Lateral spermathecae somewhat longer than medians, with sclerotized bulbs, median with unsclerotized bulbs, laterals curved inwardly.

Type data.—Holotype male, allotype female, and six immatures taken in Jackson Bay Cave, Clarendon Parish, Jamaica, 21 or 22 December 1972 (S. and J. Peck) (AMNH); one

adult male and one adult female paratypes with the same data (MCZ); one adult female paratype with the same data (TTU).

Comparisons.—This species has a limited affinity to other Antillean species. It is the only Antillean species in which the female has a flagellum composed of three articles; the spermathecae, however, resemble those of other species in the *dumitrescoae* group in having the laterals longer than the medians. The lateral compression of the male flagellum and the slight elongation of pygidial segments are unknown in the other species from the Antilles.

Distribution.—Known only from the type locality.

Etymology.—The specific name is taken from the Greek *troglo-* meaning cave, and *bios* meaning life.

Remarks.—This is the only apparent Jamaican troglobite. It may be more closely related to the *mexicanus* group than to the *dumitrescoae* group, as indicated by the flagella of both sexes. The male flagellum, however, is so highly derived that it gives no reliable clue. The slight elongation of the pygidial abdominal segments in the males adds further to the confusion of the proper placement of this species. *Schizomus troglobius* may, as with *S. armasi*, represent a relict of the *mexicanus* group which inhabited Caribbean land masses before diversification of the *dumitrescoae* group.

Schizomus infernalis Rowland
Figs. 43, 46-47, 50

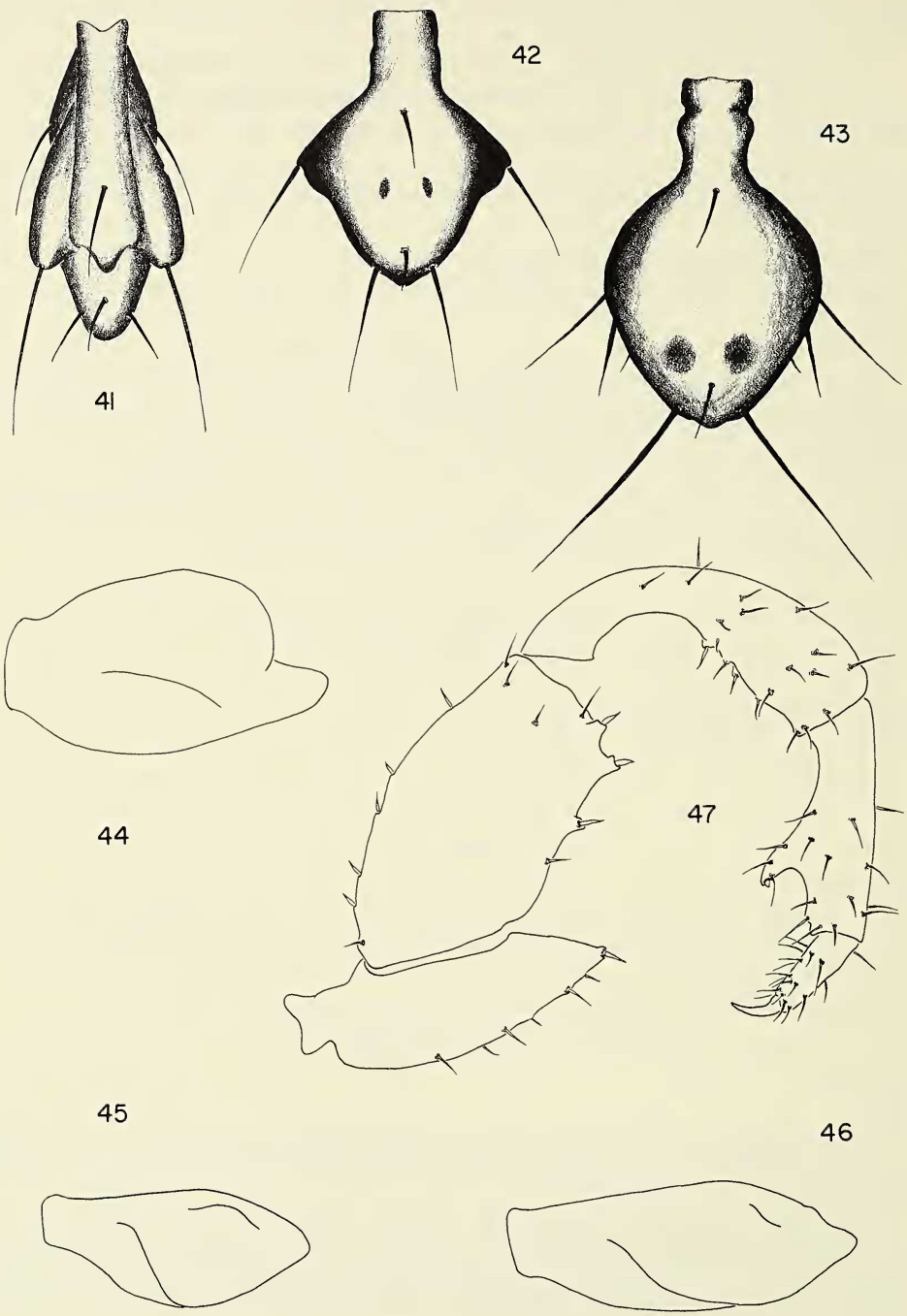
Schizomus infernalis Rowland 1975b: 18-20.

Description.—Male. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots irregular, but circular. Anterior sternum with 13 bifid setae. Abdominal tergum I with two setae, II with four setae, III-VII with two setae, VIII-IX with four setae, segment XII without evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum spade shaped, with a pair of vague dorsal depressions. Pedipalpal trochanter very long, distinctly produced apically; femur greatly thickened, with one mesal and two lateral teeth; patella curved downward, expanded distally; tibia with mesal, subapical curved spur apposible to tarsus-basitarsus; tarsal-basitarsal spurs about 1/4, claw about 2/5 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 42-8-9-9-9-10-19. Other leg segment measurements given in Table 7.

Female. Flagellum composed of three articles. Median spermathecae just slightly longer than laterals, the former curved outwardly, the laterals with more distinct terminal bulbs, no special sclerotization.

Type data.—Holotype male and allotype female taken 0.8 km N Ruinas de Palenque, near Palenque, Chiapas, México, 25 July 1973, from Berlese samples (R. Mitchell, J. Reddell) (AMNH, examined); one male and three female paratypes with the same data (TTU, examined).

Comparisons.—This species is unlike any other Mexican species in the massive development of the femur and trochanter of the male pedipalps and in the presence of four very strong dorsal setae on abdominal tergum II. The flagella of both males and females is similar to that of the species of the *mexicanus* group; the spermathecae, however, are different from *mexicanus* group species in having the median and lateral lobes nearly equal in size.



Figs. 41-47.–Parts of male schizomids: 41-46, flagella: 41-43, dorsal views: 41, *S. troglobius*; 42, *S. armasi*; 43, *S. infernalis*; 44-46, lateral views: 44, *S. troglobius*; 45, *S. armasi*; 46, *S. infernalis*; 47, lateral view of right pedipalp of *S. infernalis*.

Distribution.–Known only from the type locality.

Remarks.–This species perhaps could be placed tentatively in the *mexicanus* group, but the highly derived condition of the male pedipalps, the dorsal setation of the abdomen, and the morphology of the female spermathecae obscure its true relationships.

Schizomus sp.
Fig. 51

Description.–Female. Color greenish. Carapace with three pairs of dorsal and two apical setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata lighter than sterna. Flagellum composed of four articles. Pedipalpal trochanter not produced distally; tarsal-basitarsal spurs about 1/5, claw about 2/5 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 34-5-6-7-7-8-16. Other leg segment measurements given in Table 7. Spermathecae of aberrant form, perhaps with a small median highly convergent unsclerotized pair and a very large lateral highly sclerotized pair.

Male unknown.

Specimens examined.–One female and two immatures taken in the Sierra Nevada, Colombia (B. Malkin) (AMNH).

Comparisons.–The greenish color, four articles of the flagellum, and spermathecal form serve to distinguish this species from other New World species.

Distribution.–Known only from the Sierra Nevada, Colombia.

Remarks.–The combination of characters which serve to distinguish this species so readily from other New World species also confuses its proper placement within existing groups. In the absence of males no attempt is made to place this species.

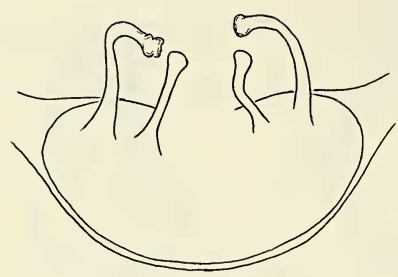
Schizomus armasi, new species
Figs. 42, 45, 49, 52

Description.–Male. Color brownish. Carapace with three pairs of dorsal and two apical setae. Metapeltidium split or entire. Eyespots distinct, round. Anterior sternum with nine bifid setae. Abdominal terga I-VII with two setae, VIII-IX with four setae, segment XII without evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum spade shaped, with a pair of faint dorsal depressions with slight lateral elevations. Pedipalpal trochanter not produced distally; femur, patella, and tibia elongate; the tibia without spurs; tarsal-basitarsal spurs about 1/8, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 25-5-6-6-5-6-13. Other leg segment measurements given in Table 7.

Female. Flagellum composed of three articles. Median and lateral spermathecae joined basally, wide, not expanded distally, slightly divergent outwardly.

Type data.–Holotype male and allotype female taken at Uvero, El Cobre, Oriente, Cúba, 25 May 1972 (L. de Armas) (IZC); one male, one female, and one immature paratypes with the same data (AMNH).

Comparisons.–This species is closely related to two Cuban species not studied by us, *S. rowlandi* Dumitresco and *S. orghidani* Dumitresco. The excellent descriptions and figures given by Dumitresco (1973, 1977) provide clear evidence of their close relationship. The male flagellum of *S. armasi* is laterally angular and bears a pair of weak dorsal



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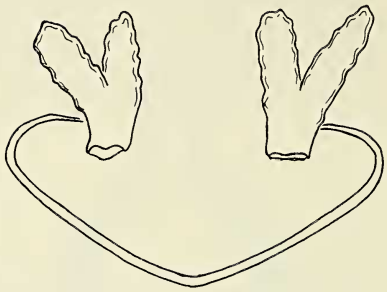

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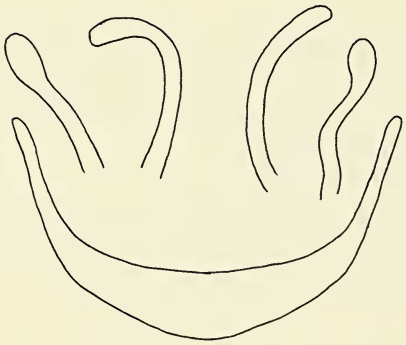

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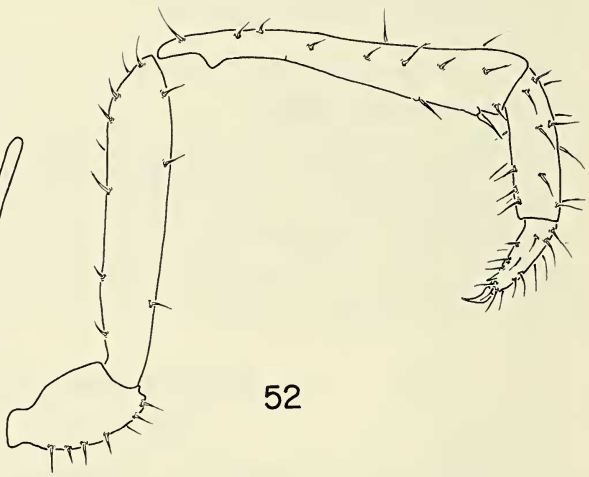

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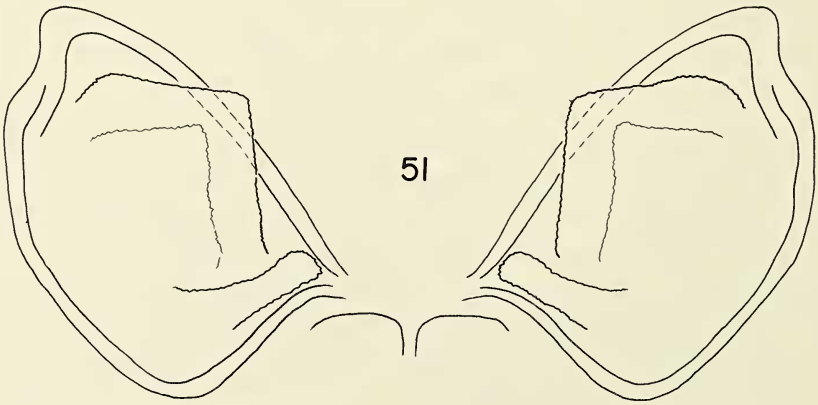

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Figs. 48-52.—Parts of schizomids: 48-51, female spermathecae: 48, *S. troglobius*; 49, *S. armasi*; 50, *S. infernalis*; 51, *Schizomus* sp. from Sierra Nevada, Colombia; 52, lateral view of male right pedipalp of *S. armasi*.

depressions, whereas the flagellum of *S. rowlandi* is gradually curved laterally and apparently without dorsal relief. The flagellum of *S. orghidani* also lacks the angularity of *S. armasi*. The pedipalps of *S. armasi* are not produced distally, whereas they are in *S. rowlandi* and *S. orghidani*. All three species share a close similarity of the female spermathecae in that the median and lateral pairs are joined basally. *S. armasi* has three pair of dorsal carapacial setae, whereas *S. rowlandi* has only two pair. *S. orghidani* also has three pairs of dorsal carapacial setae, but the median pair are greatly reduced in size. The occasional split metapeltidium in *S. armasi* will also help distinguish this species from *S. orghidani* and *S. rowlandi*.

Distribution.—Known only from the type locality.

Etymology.—The specific name is a patronym given for Dr. Luis F. de Armas, the discoverer of this and other Cuban schizomids.

Remarks.—This species should probably be placed with *S. orghidani* and *S. rowlandi* into a geographically and morphologically distinct group. This has not been done here because we have seen only *S. armasi*. These three species may represent ancient dichotomies from a proto-*mexicanus* group lineage, which may have inhabited Caribbean land masses and which may have given rise to a divergent line now largely extinct, having been replaced by *dumitrescoae* group species.

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